Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

Issued September 23, 1910.

United States Department of Agriculture,

FOREST SERVICE—Circular 181.

HENRY S. GRAVES, Forester.

CONSUMPTION OF FIREWOOD IN THE UNITED STATES.

By ALBERT H. PIERSON, *Forest Assistant.*

The use of wood for fuel is general in the United States, except in the largest cities and in the prairie States, where there is almost no native timber. The greater part of the firewood is obtained from farmers' woodlots which often have very little value for other purposes, especially when they have been neglected and the trees are knotty, or when fire has been allowed to run over the ground; but where good timber is plentiful, much that is suitable for lumber, cross-ties, cooperage, and similar purposes is cut for fuel. A large quantity of wood in sight and long distances from markets lead to a freer use than is the case where wood is scarce and dear.

The census of 1880[a] estimated that at that time there were nearly 146 million cords of wood used for fuel annually. The estimated value of this wood was approximately $322,000,000, making the average value per cord $2.21. The population of the United States at that time was a little over 50 million. Since then the population has increased to over 86 million. The use of wood for fuel, however, has decreased not only in per capita consumption but also in total quantity, since coal is now used much more extensively than at that time. The Geological Survey[b] has compiled a statement of the coal production of the United States, which shows that in 1880 the total production was 71,481,570 short tons, while in 1908 it amounted to 415,842,698 short tons, or nearly six times as much as in the former year.

The estimates in this circular are based upon information obtained from inquiries sent to more than 48,000 county and crop correspondents of the Bureau of Statistics, Department of Agriculture, supplemented in towns and cities of from 1,000 to 30,000 population by inquiries to representative firms engaged in the coal and wood business or along some line of forest products, and in cities of over 30,000 population by reports of special agents of the Bureau of the Census. Since the value of fuel wood in large cities is generally high, it was considered preferable to underestimate rather than overestimate the per capita consumption, and the population taken in compiling the estimates for some of the large cities is considerably below that claimed by the citizens themselves.

---

[a] Tenth Census of the United States, Vol. IX, p. 489.

[b] "The Production of Coal in 1908," U. S. Geological Survey, 1909, p. 25.

A preliminary compilation of the consumption of firewood on farms was made in 1908 under the direction of Dr. Henry Gannett, at that time geographer of the Bureau of the Census.

The firewood consumption in mineral operations was obtained through correspondence with operators whose names were supplied by the United States Geological Survey.

At the outset it must be clearly understood that these figures, while they are the best available and the most recent, are not absolutely accurate, since they are based on the estimates of thousands of men all over the country, many of whom were inexperienced in the use of schedules such as were sent. Moreover, the size of a "cord" of firewood is not the same in all regions of the United States. In Michigan, for instance, what is commonly called a "cord" of fuel wood is a pile 8 feet long and 4 feet high, made up of 16 to 18 inch sticks, while in California a cord often means a "stack," that is, a pile of the same length and height, but made up of 1-foot sticks. The Michigan "cord," therefore, contains about 48 cubic feet, and the California stack 32 cubic feet. In order to compare the figures on the schedules from Michigan and California, therefore, it is necessary to reduce them to a common standard. The standard taken in this circular is the full cord, 8 feet long, 4 feet wide, and 4 feet high, containing 128 cubic feet of wood and air space.

In this first attempt of the Forest Service to obtain statistics of fuel wood there has been no effort to separate the kinds of wood, nor even the hardwoods from the softwoods. The values of softwood are generally lower than those of hardwood, but it was found impracticable to attempt to show this difference.

A little more than 20 billion cubic feet of wood in all forms is used in the United States each year, and of this 7 billion cubic feet, about a third, is firewood. The amount of wood consumed as fuel is exceeded only by that put into the form of lumber and shingles.

Diagram 1 displays in graphic form the annual consumption of the various classes of forest products.

Table 1 summarizes the estimated consumption of firewood by the principal classes of consumers in 1908. The total in round numbers was 86 million cords, valued at $250,000,000 at the point of consumption.

TABLE 1.—*Estimated consumption of firewood, by classes of consumers.*

Class of consumer.	Quantity.	Value.	
		Total.	Average per cord.
	Cords.	*Dollars.*	*Dollars.*
Total—United States	86,000,000	250,000,000	2.91
On the farms	70,000,000	182,700,000	2.61
In towns and cities from 1,000 to 30,000 population	12,615,000	50,590,000	4.01
In cities of over 30,000 population	1,615,000	11,110,000	6.88
In mineral operations	1,770,000	5,600,000	3.16

These figures, as well as those in Table 2, do not include the firewood used by railroads, by steamboats, or in miscellaneous manufactures, although these items amount to a considerable quantity in some parts of the country; nor do they include the large amount of waste wood that is used in and around woodworking factories. The local consumption of wood for operating cotton gins, sugar and sorghum mills, thrashing machines, and similar plants is very large and is covered only in part by the figures for fuel used in the towns and on the farms.

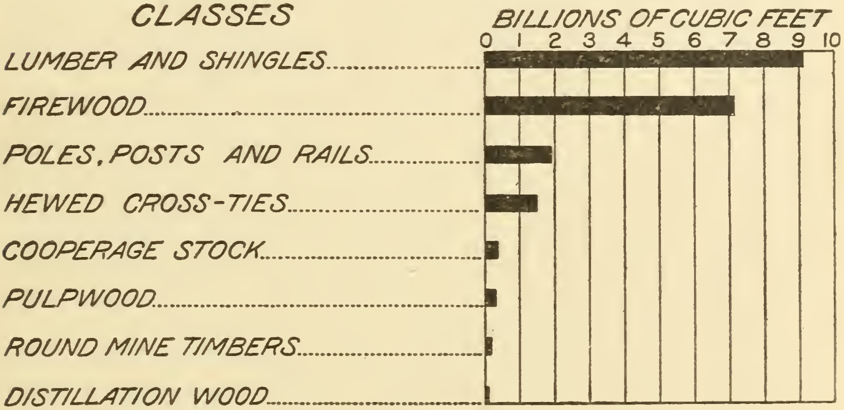

DIAGRAM 1.—Annual consumption of forest products.

Of the total estimated consumption of firewood, 70 million cords, or 81.4 per cent, was used on the farms; 12,615,000 cords, or 14.7 per cent, in the towns and cities with a population of from 1,000 to 30,000; 1,615,000 cords, or 1.9 per cent, in cities of over 30,000 population; and the remainder, or 2 per cent, in mineral operations. In these four classes of consumption, the average value per cord ranged from $2.61 for the firewood used on the farms to $6.88 for that used in the cities.

In the quantity of firewood used on the farms, Tennessee, with 4,420,976 cords, was the leading State, followed by Pennsylvania, Illinois, North Carolina, Arkansas, Mississippi, Kentucky, and Virginia. These eight States together consumed nearly 35 million cords, or 50 per cent of the total quantity used on farms. The aggregate value of the wood used for fuel on the farms in these nine States was $64,938,537, or 33.5 per cent of the total.

The quantity of firewood used on the farms varies greatly between different parts of the country on account of a number of influences, such as climate, the distance from coal fields, the development of transportation facilities, and the progressiveness of the consumers. The number of villages and towns under 1,000 population in a region also affects the figures under this head. Except in the Pacific coast States and in Arkansas, Louisiana, and Missouri, the consumption per farm west of the Mississippi River is comparatively small. The States north of the Ohio River use rather less firewood per farm than those south of it. Though this may at first glance seem strange because the climate of the Northern States is colder than that of the Southern States, it is explained largely by the fact that in the North stoves burning coal or wood are commonly used, while in the South open fireplaces are more general. Not only is relatively little coal used in the South, but fireplaces require large quantities of wood for the amount of heat produced. The effect of open fireplaces in increasing the fuel wood consumption in the South is further strengthened by the large number of tenant houses and cabins on the large plantations. In the New England States and in the South Atlantic States rather more wood is used per farm than in the Middle Atlantic States, which are within a short distance of fine coal fields and which have good transportation facilities.

Of the firewood used in towns and cities with less than 30,000 population, only Texas and Michigan reported more than 1 million cords. The figures for this class were based on a per capita consumption. Nearly 3,000 towns of from 1,000 to 30,000 population were heard from, and the firewood consumption of the remaining towns in each State was estimated from the per capita consumption of the towns which reported. The average value per cord of the firewood in this class was greater by $1.40 than that of the firewood used on farms.

Of the wood used in cities of over 30,000 population, the seven States of Washington, Texas, Oregon, Massachusetts, Michigan, Minnesota, and New York, ranking in the order named, reported an aggregate consumption of 1,021,304 cords, or 63.3 per cent of the whole amount used in such cities. The wood used in the large cities of these seven States had a value of $6,821,454. It should be noted that, with the exception of Texas, Michigan, and New York, none of these States is very near large coal fields. The average value per cord of the wood used in the large cities varied greatly throughout the United States, though in every case it was much higher than the value of the wood used in the towns and small cities. Part of this increased cost is due to freight charges, and part to middlemen's profits.

The amount of firewood used in mineral operations was only 2 per cent of the total quantity used in the United States. This does not include any timber or cordwood used for shoring or timbering the mines, but only the amount burned. Of 8,000 operators who responded to inquiries, less than 2,900 reported that they used wood for fuel. Of the fuel wood used in mineral operations, nearly three-fifths was consumed by manufacturers of clay products. Less than 15 per cent was used in mining or refining precious metals, and the rest in miscellaneous mineral operations. The only States which reported a use of more than 100,000 cords of firewood in mineral operations were Florida and North Carolina. This was due in the former State to the large quantity reported as used in miscellaneous operations, and in the latter to the importance of the use of wood in the manufacture of clay products.

Twenty-six States reported annual consumption of more than 1 million cords each, while six of these States reported more than 4 million cords each. The value of the total quantity of the wood used for fuel in Michigan, Texas, New York, Wisconsin, Indiana, Missouri, and Minnesota, and leading States in point of value, exceeded $85,000,000, or more than one-third of the value of all the firewood used. The average value varied greatly in the several States, though as a rule where the wood was plentiful and near at hand the value per cord was low. The highest average value in any State was found in North Dakota, which was closely followed by Nevada, while the lowest values were found in Georgia and Alabama.

The total quantity and value of the wood used by the several classes of consumers, by States, is shown in Table 2. These figures, it is believed, are conservative, particularly since they take no account of other uses of firewood than those mentioned in the preceding pages.

TABLE 2.—*Estimated quantity and value of the firewood used on the farms, in the towns and small cities, in cities, and in mineral operations in 1908, by States.*

State.	Used on the farms.		Used in the towns and cities of from 1,000 to 30,000 population.		Used in the cities of over 30,000 population.		Used in mineral operations.		Aggregate.		
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Total value.	Average value per cord.
United States	*Cords.* 69,961,066	$182,653,869	*Cords.* 12,611,033	$50,549,855	*Cords.* 1,613,592	$11,106,526	*Cords.* 1,751,115	$5,530,478	*Cords.* 85,936,806	$249,840,728	$2.91
Alabama	4,125,100	6,930,168	245,630	668,114	24,334	149,504	34,068	55,446	4,429,132	7,803,232	1.76
Arizona	59,253	245,900	45,430	298,475			33,091	163,125	137,774	707,500	5.14
Arkansas	3,839,880	6,282,643	422,460	1,292,728	16,500	75,570	23,950	44,125	4,302,790	7,695,066	1.79
California	848,745	4,583,133	307,740	2,151,103	61,830	737,632	74,369	294,645	1,292,684	7,766,513	6.01
Colorado	138,320	460,606	38,780	166,930	10,830	75,138	21,298	81,365	209,228	784,039	3.75
Connecticut	272,170	1,129,506	180,200	828,920	17,525	140,638	25,475	105,741	495,370	2,204,805	4.45
Delaware	69,160	214,396	23,040	73,037	540	6,480	2,040	6,495	94,780	300,408	3.17
District of Columbia					25,000	225,000	111	645	25,111	225,645	8.99
Florida	426,096	1,083,284	251,680	727,364	10,667	69,336	174,764	403,068	863,207	2,283,052	2.64
Georgia	4,212,960	6,319,440	468,860	1,223,725	54,450	300,564	81,126	151,662	4,817,396	7,995,391	1.66
Idaho	160,732	659,001	53,480	266,330			46,518	181,122	260,730	1,106,453	4.24
Illinois	2,066,358	7,438,889	251,760	946,618	48,800	299,872	38,206	186,186	2,405,124	8,871,565	3.69
Indiana	2,176,812	8,554,871	419,150	1,949,048	15,640	106,665	75,911	216,318	2,687,513	10,826,902	4.03
Iowa	1,257,420	4,916,512	138,820	662,171	3,843	24,149	9,275	36,922	1,409,358	5,639,754	4.01
Kansas	(*a*)	(*a*)	46,720	206,970	817	4,085	535	2,340	*b* 48,072	213,395	4.44
Kentucky	3,519,996	7,286,392	145,080	451,199	1,213	4,715	12,511	27,682	3,678,800	7,769,988	2.11
Louisiana	2,143,104	4,564,812	275,520	997,382	39,000	234,000	67,195	148,312	2,524,819	5,944,506	2.35
Maine	747,760	2,841,488	453,000	2,097,390	7,500	72,525	20,140	69,049	1,228,400	5,080,452	4.14
Maryland	506,130	1,518,390	58,400	216,080	30,800	258,720	5,794	17,529	601,124	2,010,719	3.34
Massachusetts	407,320	1,649,646	380,200	1,771,732	122,416	818,739	74,385	323,450	984,321	4,563,567	4.64
Michigan	2,538,900	10,663,380	1,008,930	5,132,454	114,875	663,803	37,628	106,953	3,700,333	16,566,590	4.48
Minnesota	1,948,700	7,794,800	374,400	1,583,714	103,200	792,576	46,114	130,100	2,472,414	10,301,190	4.17
Mississippi	3,709,488	7,307,691	325,080	900,472			30,500	60,005	4,065,068	8,268,168	2.03
Missouri	3,635,137	9,451,356	305,150	1,010,047	11,673	78,507	35,590	126,221	3,987,550	10,666,131	2.67
Montana	168,462	518,986	45,150	228,011	8,349	62,617	20,056	91,866	242,017	902,380	3.73

Nebraska	(a)	(a)	21,500	100,835	4,942	32,884	2,569	10,379	[b] 29,011	144,098	4.97
Nevada	17,035	103,402	29,680	193,514			26,965	167,377	73,680	464,293	6.30
New Hampshire	352,000	1,193,280	307,010	1,175,848	8,167	57,169	23,507	94,354	690,684	2,520,651	3.65
New Jersey	266,805	979,174	53,460	266,231	29,382	205,968	9,326	41,803	358,973	1,493,176	4.16
New Mexico	59,114	198,032	28,550	109,347			23,653	85,548	111,317	392,927	3.53
New York	2,090,800	9,011,348	404,070	2,036,513	90,180	1,313,021	65,279	360,189	2,650,329	12,721,071	4.80
North Carolina	4,043,460	7,076,055	713,260	2,196,841			116,748	250,356	4,873,468	9,523,252	1.95
North Dakota	(a)	(a)	65,920	443,642			9,490	34,255	[b] 75,410	477,897	6.34
Ohio	2,390,856	8,150,655	236,280	1,011,278	3,441	24,053	49,534	111,637	2,680,111	9,297,623	3.47
Oklahoma	1,528,800	3,974,880	149,720	558,953	4,300	20,769	3,065	8,793	1,685,885	4,563,395	2.71
Oregon	520,509	1,977,934	300,480	1,246,992	175,000	962,500	40,443	146,432	1,036,432	4,333,858	4.18
Pennsylvania	1,648,220	3,708,495	169,420	491,318	36,555	179,981	14,962	42,012	1,869,157	4,421,806	2.37
Rhode Island	49,482	211,288	37,160	172,794	9,032	84,367	2,216	8,976	97,890	477,425	4.88
South Carolina	2,631,720	5,210,796	363,850	938,733	9,333	51,331	56,091	138,993	3,060,994	6,339,853	2.07
South Dakota	(a)	(a)	43,920	249,366			52,114	213,167	96,034	462,533	4.82
Tennessee	4,420,976	7,515,660	253,760	700,378	19,487	65,049	36,301	73,248	4,730,524	8,354,335	1.77
Texas	2,518,360	6,549,939	1,351,360	5,310,845	179,333	923,015	55,933	176,507	4,104,986	12,960,306	3.16
Utah	97,128	389,455	20,860	89,907	583	11,660	3,760	12,186	122,331	503,208	4.11
Vermont	430,252	1,592,302	258,020	1,094,005			2,630	9,668	691,002	2,695,975	3.90
Virginia	3,384,576	6,769,152	204,400	768,544	22,780	170,850	28,816	76,572	3,640,572	7,785,118	2.14
Washington	602,613	2,458,661	467,280	2,079,396	236,300	1,347,800	74,525	218,900	1,380,718	6,104,757	4.42
West Virginia	906,448	2,257,056	19,650	65,631	1,220	4,270	880	2,004	928,198	2,328,961	2.51
Wisconsin	2,110,548	7,281,380	845,260	3,389,493	53,755	451,004	54,358	183,237	3,063,921	11,305,114	3.69
Wyoming	53,635	201,131	1,503	8,537			7,300	33,513	62,438	243,181	3.89
All other States [c]	859,626	3,428,504							859,626	3,428,504	4.00

[a] Included in "All other States."

[b] Wood used on the farms included in "All other States."

[c] Includes Kansas, Nebraska, North Dakota, and South Dakota.

Approved:
W. M. Hays,
Acting Secretary of Agriculture.

Washington, D. C., *July 25, 1910.*